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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,798	01/18/2002	Dirk Schubert	NI 140	9386

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EXAMINER

LE, JOHN H

ART UNIT	PAPER NUMBER
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2863

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/056,798

Applicant(s)

SCHUBERT, DIRK

Examiner

John H Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 5 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-8 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4, 9 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment

1. This office action is in response to applicant's amendment received on 11/24/2003.

Claims s 1-3, 6-7, and 9 have been amended.

Claim 5 has been cancelled.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Estes et al. (USP 5,186,985).

Regarding claim 1, Estes et al. teach a method for determining the molecular weight of polymers (e.g. Col.7, lines 49-59, Col.9, lines 15-17, Col.23, lines 13-15) comprising the steps of: spin coating a substrate with a polymer to prepare a thin layer of the polymer whose molecular weight is to be determined (Col.1, lines 30-33, Col.6, lines 54-68, Col.13, lines 13-33, Col.22, lines 35-45), determining the thickness of said layer by an ellipsometric method and calculating (e.g. Col.14, lines 47-Col.15, line 25), with the thickness determined by said ellipsometric method, the molecular weight of the polymer material from a layer thickness molecular weight correlation (e.g. Col.14, lines 47-Col.15, line 25, Col.22, lines 35-45, Col.23, lines 5-15).

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Regarding claim 2, Estes et al. teach the thin polymer layer is prepared from a polymer solution on a substrate by a spin-coating process (Col.1, lines 30-33, Col.6, lines 54-68, Col.13, lines 13-33, Col.22, lines 35-45).

Regarding claim 3, Estes et al. teach after determining the thickness of the polymer layer, the layer is removed from said substrate by the application of a solvent (Col.1, lines 30-36, Col.16, lines 1-62) while said substrate is rotated (e.g. Col.1, lines 32-48, Col.16, lines 1-62).

Allowable Subject Matter

4. Claims 6-8 are allowed.
5. Claims 4, 9, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 4, none of the prior art of record teaches or suggests the combination of a method for determining the molecular weight of polymers, wherein the method which comprising steps of spin coating a substrate with a polymer to prepare a thin layer of the polymer whose molecular weight is to be determined, determining the thickness of said layer by an ellipsometric method and calculating, with the thickness determined by said ellipsometric method, the molecular weight of the polymer material from a layer thickness molecular weight correlation, wherein, after determining the thickness of the polymer layer, the layer is removed from said substrate by the

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application of a solvent while said substrate is rotated, and wherein, after removal of the polymer layer from the substrate by said solvent, said substrate is continued to be rotated for a predetermined time. It is these limitations as they are claimed in the combination, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 7, none of the prior art of record teaches or suggests the combination of an apparatus for determining the molecular weight of polymers, wherein the apparatus comprising a support structure supporting a substrate, an arrangement for providing on said substrate a thin polymer layer including means for supplying said polymer whose molecular weight is to be determined to said substrate and said substrate is supported by a support structure, which is rotatable about a vertical axis and which is rotated to subject the polymer solution supplied to said substrate to centrifugal forces for spreading said polymer solution on said substrate to form said thin polymer layer, and an ellipsometer disposed above said substrate for determining the thickness of said thin polymer layer disposed on said substrate. It is these limitations as they are claimed in the combination, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 9, none of the prior art of record teaches or suggests the combination of a method for determining the molecular weight of polymers, wherein the method which comprising steps of spin coating a substrate with a polymer to prepare a thin layer of the polymer whose molecular weight is to be determined, determining the thickness of said layer by an ellipsometric method and calculating, with the thickness

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determined by said ellipsometric method, the molecular weight of the polymer material from a layer thickness molecular weight correlation, wherein, after determining the thickness of the polymer layer, the layer is removed from said substrate by the application of a solvent while said substrate is rotated, wherein, for determining the molecular weight of the polymer, the relationship used is

$$\text{Layer thickness } d \sim [\eta]^{1/3}$$

$$\text{and } [\eta] = KM^A \text{ (Staudinger equation)}$$

wherein, $[\eta]$ = intrinsic viscosity number

$$K = \text{constant [volume/mass]}$$

$$A = \text{constant, and}$$

$$M = \text{molecular weight.}$$

It is these limitations as they are claimed in the combination, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 10, none of the prior art of record teaches or suggests the combination of a method for determining the molecular weight of polymers, wherein the method which comprising steps of spin coating a substrate with a polymer to prepare a thin layer of the polymer whose molecular weight is to be determined, determining the thickness of said layer by an ellipsometric method and calculating, with the thickness determined by said ellipsometric method, the molecular weight of the polymer material from a layer thickness molecular weight correlation, wherein, after determining the thickness of the polymer layer, the layer is removed from said substrate by the

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application of a solvent while said substrate is rotated, and wherein said solvent is applied for 5 - 10 seconds. It is these limitations as they are claimed in the combination, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Response to Arguments

6. Applicant's arguments filed 11/24/2003 have been fully considered but they are not persuasive.

-Applicant argues that the prior did not teach "a method for determining the molecular weight of polymers comprising the steps of: spin coating a substrate with a polymer to prepare a thin layer of the polymer whose molecular weight is to be determined, determining the thickness of said layer by an ellipsometric method and calculating, with the thickness determined by said ellipsometric method, the molecular weight of the polymer material from a layer thickness molecular weight correlation".

- Estes et al. teach a method for determining the molecular weight of polymers (e.g. Col.7, lines 49-59, Col.9, lines 15-17, Col.23, lines 13-15) comprising the steps of: spin coating a substrate with a polymer to prepare a thin layer of the polymer whose molecular weight is to be determined (Col.1, lines 30-33, Col.6, lines 54-68, Col.13, lines 13-33, Col.22, lines 35-45), determining the thickness of said layer by an ellipsometric method and calculating (e.g. Col.14, lines 47-Col.15, line 25), with the thickness determined by said ellipsometric method, the molecular weight of the polymer material from a layer thickness molecular weight correlation.

Conclusion

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7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. Specifically *Estes et al.* has been added to second ground of rejection.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John H Le whose telephone number is 571-272-2275. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John H. Le

Patent Examiner-Group 2863

February 24, 2004



John Barlow
Supervisory Patent Examiner
Technology Center 2800